

# PROGRESS IN THERAPEUTICS.

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MR. PRESIDENT AND FELLOW MEMBERS OF THE PHILADELPHIA COUNTY MEDICAL SOCIETY:

The pleasant custom of our Society calls upon the retiring President to signalize his departure from the Chair by making an address to its members; and extends the time for such address to a sufficient period after he has been relieved from the cares of office to permit him to give his attention to the preparation of a paper deserving of your consideration. I regret that I have not been able to fulfil more worthily the design of your Constitution and custom, but the thoughts to which I shall invite your attention are of some importance; perhaps sufficiently so, to atone for the crudity of their presentation.

We take up our time at these meetings, very properly, with practical matters; with reports of cases from which we can derive instruction in the management of future cases, or concerning which we may be enlightened by the criticism of our fellows; or we bring before each other the results of our studies and investigations in the laboratory, for criticism and comment and for mutual instruction. Most of our daily worktime, too, is occupied with the so-called practical matters of relieving those who appeal to us—or at least in endeavoring to relieve them—so that, perhaps, those of us who are not engaged in teaching, who are not engaged in research, pay but little attention to the theory of our art and our science; and some of us, perhaps the majority, consider that theoretical matters are unworthy of much attention; that the physician who is a theorist is unlikely to be a safe physician; that he is more likely to go astray after his false gods of hypotheses in pathology and “fads” in treatment than to occupy his time in learning the practical duties of his profession.

Yet I think this is a mistake. Whether we are theorists consciously or not, we are all theorists unconsciously; and the most practical act and the simplest, in the treatment of the sick, is guided either by correct theory as to the nature of the affection with which the patient is suffering and of the means applicable to its relief, or by an incorrect theory as to one or both. Therefore it is, perhaps, worth our while, once in a year, to

review, somewhat, the theoretical principles upon which our practice is based, that we may see whether or not they are sound, and whether and how they point to future progress.

Anatomy, physiology, pathology, bacteriology, the various sciences with which physicians are concerned, do not directly interest our patients. The patient comes to the physician for relief from suffering, and the physician is above all else in the minds of the public, in the mind of the particular individual who seeks his aid, a healer, one skilled in the knowledge of the methods by which those disturbances called disease can be removed or relieved. Thus, it is in therapeutics, especially in the practical application of remedial measures to the relief of the sick, that the physician comes into the most personal and intimate relations with his patient. Of course it is a higher branch of our art and science to prevent disease, and to teach prevention. But, when public and private sanitation have failed, or when through neglect of right living, public and private, disease has become established and application is made to the physician for relief, then the therapist must be first. The physician, as therapist, is the one who is sought.

In the history of the nineteenth century great reference will be made to discoveries in the exact sciences. The medical sciences have yielded their full proportion of these; discoveries in the structure and functions of the human body; discoveries in the agencies and processes of disease; the vast science of bacteriology opening for the first time with its knowledge, direct and indirect, and the possibilities to which it leads.

That great practical advances in treatment—apart from the marvels of surgery so well calculated to hold the popular eye—have also been made during the century is generally admitted; but whether these advances have been based upon the development of scientific principles or are merely happy accidents, is disputed. While it is not my purpose to give an historical review or even to refer in detail to the observations upon which certain broad historical views may be based, yet it is, I think, possible to show by brief references to certain prominent events in the history of medicine during the nineteenth century, that the advances in the theory of therapeutics have been as definite and as useful as the improvements in practice.

Any scientific theory of recovery must be based upon scientific views of the causation and development of disease; and these in turn must be founded upon equally definite and rational views of the development, the normal constitution, and the normal functions of the animal organism. Scientific therapeutics must, therefore, follow scientific pathology; and its application, moreover, must depend upon accurate diagnosis. So

long as guesswork constituted the principal portion of physiology and pathology, so long as diagnosis was vague and uncertain, so long empiricism necessarily dominated therapeutic practice and vague or misleading theories were constructed to satisfy the inquiring mind seeking for an explanation or even for a rational hypothetic basis of such practice. Here, perhaps, I must interpolate a word of qualification: I have no wish to follow the fashion of the day in decrying empiricism. In the absence of definite physiologic and pathologic knowledge, the alternatives submitted to the intelligent physician were, and always will be, rational empiricism or irrational dogmatism; and it is to the empiric school of Hippocrates rather than to its dogmatic opponents, that must be ascribed the foundations of scientific medicine. Nor is it to be forgotten that observation at the bedside may be as scientific as observation in the laboratory; or that the result of laboratory experience is as truly empiric, in the large sense, as the result of clinical experience.

In the domain of therapeutics the unscientific character of dogmatism cannot be better shown than by reference to that comparatively modern school of dogmatists founded by Hahnemann. The modern graduate of the college in our own city which bears the name of Hahnemann has departed widely from the theory and the practice of the founder of homeopathy; and what I shall say will have no reference to such heretical homeopathists.

Hahnemann and his early followers rightly finding much irrationality, perhaps harmfulness, in the theory and practice of their contemporaries, sought for some guiding principle that might be applied in the treatment of all cases of disease, and which would obviate the apparent necessity of resort to the violent purgings, bleedings and blisterings and the nauseous polypharmacy then in vogue. But Hahnemann fell into an error worse than that of his contemporaries. He abandoned the methods of observation and induction by which, however crudely and imperfectly, physicians were guided; contemned the study of physiology and pathology; repudiated nosologic diagnosis; rejected with terms of opprobrium any belief in the curative powers of nature; and substituted for all these an absolute dogmatism entirely independent of observation, based upon a one-sided metaphysics, and affirming as a chief tenet the sole and universal curative power of drugs. The drugs were to be administered after a certain fashion, and to many this seems the most important feature of his doctrine; but, in reality, faith in the power of drugs and belief in their necessity form, for the philosophical inquirer, the greater member of the paradoxical couplet: paradoxical because in his writings

Hahnemann insists, throughout, upon the intangible, spiritual nature of life and its processes and the necessity for equally intangible and spiritual agencies as remedies for its derangements. From the necessity to reconcile these opposing beliefs arose the doctrine of the potentization of medicinal substances by attenuation, because thus only could their spiritual forces be released to act upon the spiritual life processes in health or disease.

There is always a class of educated—or half-educated—persons whose training has been literary and artistic rather than scientific, to whom such mysticism in medicine will strongly appeal. In our own day almost equal fashion and vogue have been given to a similar delusion and to a method of practice built thereon, which, unwarrantably associating with itself the name and authority of religion, assumes the title of “Christian Science.” The system of Mrs. Eddy and the system of Hahnemann have these things in common ; that both assume to be revelations from God ; that both deny the materiality of the alterations produced in the human body in disease ; and that both assert the necessity of immaterial curative agents. The nature of these immaterial curative agents is different in the two systems—the spiritual forces set free from drugs by solutions, shakings and poundings in the one case, the spiritual force of pretentious and meaningless jargon or of dislocated syntax in the other case—but this difference is also immaterial. I am not now concerned either in elucidating or in refuting their special errors, but merely in illustrating the inevitable tendency of dogmatism as opposed to rational empiricism in therapeutics. It can lead only to systematized delusions.

But, though the rational physician of the present day must be an empiricist, he must also be a theorist. He must have a reason for that which he does and for that which he refrains from doing, in his endeavors to prolong life, to promote comfort, and to bring about recovery ; while his experience as to the results of such doings or such refrainings must remain the ultimate test whereby he determines the correctness of his reasoning and decides upon persistence in, abandonment, or modification of his course.

Progress in therapeutics, therefore, depends not only upon acuteness of observation at the bedside, not only upon accuracy of experimentation in the laboratory of physiology or chemistry or pharmacology, but also upon broadness of grasp and accuracy and acuteness of reasoning, in establishing general principles and in applying special deductions. While the therapeutic art will necessarily always outrun therapeutic science:—as for example the use of quinine in ague antedates the rational explanation of its action, only possible after the discovery of the malarial

parasite:—as for example the usefulness of mercury and the iodids in the cure of lues have as yet no satisfactory explanation;—nevertheless, therapeutic science can advance and be followed rather than preceded by advances in the therapeutic art, when we shall have learned to properly coordinate the discoveries now becoming independently developed in laboratories of medical and general science. Indispensable to such coordination, seems to me that conception of the general character of vital processes as the manifestation of a special mode of universal energy, correlated with but differing from all other modes of energy, which I have endeavored to organize by the introduction of the term *bionergy*. Bionergy is vital force, but not the unrelated vital force of older writers. It is convertible into and reproducible from all other forms of molar or molecular motion; and the term affords the conception necessary to bring the phenomena of normal and abnormal life into definite relation with our general conceptions of cosmic processes.

On the other hand, the development of a science of therapeutics has been seriously threatened during the present century by certain great discoveries made in other branches of medicine and biology and by the almost miraculous achievements of synthetic chemistry—one-sided interpretations of the discoveries and unbalanced enthusiasm over the powers of the new agents added to the *materia medica*, being responsible for these temporary aberrations.

The development of the cellular pathology with the discoveries which it brought about as to the more intimate nature of lesions, and the attention which it concentrated upon morbid anatomy, was followed by an era of therapeutic nihilism. Or rather, as it has been said that the government of Russia is “a despotism tempered by assassination,” so perhaps might we say in this respect, that it was an era of nihilism tempered by credulity. Out of these equally unscientific errors we are only now beginning to emerge. Nor is it strange, in view of the extravagant ideas concerning the effects of remedies which had previously held sway, when but vague notions were entertained as to the actual constitution of the human organism and as to the changes therein producing or produced by disease, that those who now saw with the enlarged eye of microscopy the new world of cells and cell alterations and realized the futility of attempting to influence these by the methods of drug administration that had been so positively claimed to be curative, should in reaction, deny to art all power over disease and its processes; and should attribute recoveries simply to the failure of the agents of disease to maim or kill.

So, too, in another direction, the discovery of the large part played in etiology by bacteria led not only to a grossly inadequate conception of

the rôle of the human organism itself in lesion and in symptomatology, but also to the fallacious notion that the agents of cure must be sought in germicides; so that for a time the corrosive chlorid of mercury promised to become the physician's panacea and the surgeon's chief dependence. It is no small satisfaction to me to remember that I opposed these views from the beginning, even at the cost of being called "reactionary."

When Brown-Sequard first began to investigate the therapeutic properties of glandular secretions, and following this came the demonstrated usefulness of thyroid gland substance in myxedema, the animal extracts became the subject of foolish or fraudulent exploitation; but this has already been outlived, and the scientific study of the internal secretions and of the physiologic functions and toxic properties of animal tissues and fluids offers great possibilities of increased therapeutic knowledge and power.

When the synthetic chemists produced kairin, antipyrin and the other coal-tar products, with their tremendous power in depressing temperature and in relieving pain, the temptation to bring about sudden and striking results with these agents was too great to be resisted; and many physicians deluded themselves with the idea that in suppressing a symptom they were fighting disease. In nothing was this bad practice, due to want of a sound therapeutic theory, more disastrously manifested than in the treatment of the pandemic of influenza only ten years ago. If influenza then slew its thousands, antipyrin slew its tens of thousands. And only less disastrous was the use of this drug and its congeners in cases of typhoid fever and of pneumonia. As the medical historian comments upon the abuse of bloodletting in the eighteenth century, so will he comment upon the abuse of antipyretic medication in the nineteenth century.

But to digress for a moment—as in every evil there is some good, so in abused remedies there is still a power of usefulness. There is a legitimate field for the drugs of the coal-tar series in the palliation of certain symptoms of nervous origin; so also is there a field for bloodletting in the toxemias, as in pneumonia, in uremia, in puerperal infections and the like, especially as a preliminary to the use of physiologic salt solution; and both of these applications are to be numbered among the century's advances in therapeutic art and science.

Still another danger, arising out of the great power over symptoms of the modern synthetic remedies and the great improvements constantly making in the art of pharmacy, is the flood of proprietary remedies, secret or half-secret, that has been let loose upon the profession and the

public. In so far as they are not secret, these threaten to destroy the art of rational prescription. Organs that are disused, atrophy. The practitioner who is lazily contented to give the mixture exploited by some manufacturing firm, rather than to use his own brains to find a remedy or a combination of remedies suitable for the case of his individual patient, loses the faculty of selecting or combining remedies. In so far as these preparations are secret nostrums, they threaten to destroy all therapeutic science; for ignorance, which is the aim of secrecy, is the very antithesis of science. The physician who uses an alleged remedy of the composition of which he is ignorant, can have no scientific basis for his action, can add nothing to his own knowledge for guidance in future cases, can add nothing to the general store of knowledge of the profession. It is to be hoped that from the high ground this Society has taken in regard to nostrums and nostrum advertising, it will not, even by inadvertence, depart.

Yet, as has been intimated, all these dangers are but temporary; they are incidents marring what is otherwise a steady advance toward science in therapeutics. The cellular pathology gave us definite knowledge concerning morbid processes and their results. The bacterial etiology has led by its further development to the correction of its own errors; so that now, in the studies of the products of bacteria and their changes in character and power in various culture media and under diverse environment, and more especially in the investigations into the reaction of the organism chemically, physically and vitally to their invasion, we are beginning to have the basis of at least a working hypothesis of infection and immunity, with much light upon the processes of normal recovery. These developments in scientific pathology, together with the advances that have been made in physiology and especially in the study of normal and morbid metabolism, are surely leading to the establishment of broad generalizations concerning disease and recovery on which a real therapeutic science may be built.<sup>1</sup> Meanwhile the advances in chemistry and chemical pharmacology not only give us in the present new and powerful agents in treatment, but by the particular relations which certain molecule groups are found to bear toward physiologic reaction and toward effect upon symptoms, promise for the future an important and exact datum for the selection of chemical remedies under given conditions of disease. A suggestion of the weightiness of such

<sup>1</sup> I have discussed this subject at greater length in my address before the Medical and Surgical Faculty of Maryland: "Some Thoughts Concerning Disease and Recovery in their Relation to Therapeutics." Proceedings, etc., Baltimore, 1896. The Therapeutic Gazette, September 15, 1896.

datum is found in Loeb's experiments showing that chemical changes in the media in which the ova of echinoderms have been placed, may influence the development of the larvæ, even to the apparent reproduction of healthy adults from unfertilized eggs. The development of a queen bee by special food is likewise an illustration in point.

But while we await the full fruition of these various lines of investigation, there are, nevertheless, certain important facts already available, not only in the therapeutic art, but also in the beginnings of the therapeutic science.

Recognizing in the living unit, known as the cell, the basis of all living organisms, we must look to its constitution and to its powers, as shown by its reaction to environment, for the explanation of the structure and the powers of the developed organism, even of so complex an organism as the human body with its great nervous development. This applies to pathology as well as to physiology; for the same structures, powers, qualities, susceptibilities that determine normal reaction to friendly environment—or health—likewise determine normal reaction to unfriendly environment—or disease.

While the modern confirmations of Elsberg's doctrine of the continuity of bioplasm modify the old cellular theory in respects that we need not here touch upon, for our purposes they merely emphasize its important lessons in showing the interdependence of all tissues, organs and functions. This, too, is the lesson finally emerging from the discoveries and theories of Weissmann. Though the original cell divide and redivide, its impress remains upon all its progeny and the developed adult man contains no structure and no function that was not potential in the fertilized ovum.

Division of labor, specialization of structure and of function, have caused and are illustrated in the differing tissues and organs resulting from the unfolding of the ovum. These having assumed, during the long ages of evolution, certain forms, dispositions and relations toward each other and the environment, such dispositions and relations tend to become permanent, constituting the harmony we term health. Disturbed by environmental change or internal failure, the organism seeks to restore them and this *vis medicatrix naturæ* gives rise to certain unusual manifestations that mingle with the manifestations of disturbed order; the whole series of disturbances and compensations constituting the symptomatology of disease. All symptoms, therefore, are not morbid; on the contrary many are evidences of salutary reaction. Disease and recovery are one continuous vital process. Thus it becomes necessary for the physician as therapist to make, not only a clinical and pathologic

diagnosis, as accurately as the state of science and his own skill permit, but also a therapeutic diagnosis:<sup>1</sup> in order to determine which of the symptoms may indicate a tendency toward impairment of the natural order and thus invite opposition or modification by art, and which indicate a tendency towards restoration of the natural order and thus invite rather encouragement when present, and invitation or imitation when absent. No better illustration can be found than febrile temperature,<sup>2</sup> which Hippocrates from his empiric observation taught was an indication of the attempt of nature to bring about recovery, but which only a few years ago modern physicians were fighting with depressing drugs. In those recent laboratory observations which show that the products of the pneumococcus after having been exposed to a temperature of 41° to 42° C. for three or four days or to a higher temperature for a shorter time, will, when injected into the blood of animals, soon bring about the production of antitoxic substances even to complete immunity in three or four days; while, if unsubjected to such heat, the antitoxin will develop only after some fourteen days of fever in the animal, we have at least a suggestion of a general explanation of the utility of fever heat; and a confirmation of the opinion that some clinicians have frequently expressed that in pneumonia at least, it is often unwise to try to reduce temperature.<sup>3</sup>

So, too, in the demonstrated abstraction of sodium chloride from the serum in the process of neutralization of toxins, in the observations showing that dilution of certain antitoxic or alexic serums can be made without loss of power if sodium chloride solutions be employed, and considering in this relation the clinical observation of the decrease of chlorides in the urine in pneumonia, we have a partially empiric, partially scientific foundation for the use of physiologic salt solution in the toxemias.

The antitoxins of diphtheria and of tetanus, the neutralization of snake-poisons by "antivenine" and by bile, point to the possible development of other natural means of protection or cure in other acute infectious and toxic diseases. Even the failures of tuberculin and its modifications are items of progress; for the differences in the essential processes of tuberculosis and the acute, transitory infections are thus emphasized. But even more suggestive than these are the demonstra-

<sup>1</sup> Concerning the therapeutic diagnosis there is much more to be said; part of which I have published in my Dartmouth lectures on "The Principles Governing the Selection of Cardiac Medicaments;" *N. Y. Med. Journal*, Nov. 29 and Dec. 6, 1890.

<sup>2</sup> See also my lecture on "Some of the Therapeutic Relations of the Nervous System;" *Therapeutic Gazette*, March, 1891.

<sup>3</sup> Personally I have seen the hot bath to produce free sweating, followed with hypodermoclysis of physiologic salt solution (F. P. Henry) do great good in some cases of pneumonia.

tions of the powers of the internal secretions dating from Murray's happy experience with thyroid extract in myxedema and not yet culminating even with the exhibition of the wonderful properties of the suprarenal gland.

That in the not too remote future, we shall have substances of laboratory production, replacing or supplementing the antitoxins and the antitoxin-provoking substances obtained from animals, and even resembling in some degree the extracts of animal tissues and secretions, is not too much to hope. But, even beyond these agencies, and in their absence, there lies a great undeveloped field of therapeutics in which the workers are too few and the results not sufficiently studied with scientific exactitude. I mean those measures which for want of a better term, I have called "physiologic therapeutics," and of which having spoken at length so often, I will not now weary you with any elaboration. But in continuance of the thought expressed a short time ago, concerning the powers of the cell, the development of the organism by action and reaction with its environment and the tendency of the order thus constituted to persist, I may at least suggest that those influences which have been most potent in bringing the body and mind of man to their present state should likewise be among the most potent influences for the maintenance of man's body and mind in health, and for their restoration, when disturbed, to normal conditions.

Sunlight, electric action, heat, cold, air, water, food, exercise, rest and the animal, mental and spiritual emotions have been among the factors through which inanimate material has become living, living material has organized into cells, and cells have developed into succeeding forms, higher and higher, physically, mentally and morally, until at last has appeared the man "but little lower than the angels."

By the intelligent application of similar factors, including the emotions, the physician can do much towards restoring the body and the mind diseased. Hydrotherapy has not its sole application in the Brand bathing of typhoid fever; it is not only in tuberculosis that the building up of vital resistance by food and air and sunlight and climatic influences brings the final victory to nature; nor are hysteria and neurasthenia the only affections in which rest and proper nutrition and passive exercise and electric stimulation and the mental influence that can be rightly exerted by the right-minded physician, may bring about the restoration of health. What Brand has done for the subjects of typhoid, what Waldenburg and Bremer have done for consumptives, and Weir Mitchell for the hysterical and the neurasthenic, some of us should do for other sufferers. We should not abandon these great agencies, so largely,

to the quack and the charlatan. In every medical delusion, even in homeopathy and in christian science, there is an element of truth. The extensive experiments made by homeopaths through the use of inert remedies, demonstrated the truth of Bigelow's teaching of the self limitation of acute diseases; while the development of antitoxins, through the irritation of cells by attenuated cultures of bacilli and of their products and the difference in effects of large and small doses of powerful agents, so strikingly shown in the case of suprarenal substance, permit us to see that in the homeopathic reaction theory of cure, there is an adumbration of a scientific fact. So, too, the aberrations of the "christian scientists" emphasize the undoubted power of the emotions, both in producing certain kinds of morbid action and in remedying them.

Therapeutics must progress, therefore, by recognizing that disease and recovery are alike vital processes, to be studied in relation to all the laws of life :

That the tendency of the natural order, the harmony of functions, the balance of relations, we term health, is to persist and to become reestablished by internal reactions when its persistence and resistance have been temporarily overcome; so that the forces of recovery come from within, rather than from without :

That thus the agents provoking disease and the agents used as remedies, must be considered merely as liberators of energy, intensifying or modifying natural processes, but introducing no new power or quality into the operations of the organism :

That the physical and mental environment, as they have been potent in determining the evolution of the animal organism, are also potent in determining its order and in assisting to restore order :

That thus the most active remedial agents the physician can employ are those produced within the animal body itself in its physiological functions and compensations, and in its resistance to the attacking agents of disease :

That in the use of these agents or others to control, modify or oppose the course of the disease or of special symptoms, or in refraining from all interference, the physician must be guided by a large knowledge as to the significance of symptoms as indications of morbid disturbance, or of salutary reaction :

That interference having definite object must aim to restore the balance of function, either by exaltation of unduly depressed function and depression of unduly exalted function to the normal levels, or by depression and exaltation of normal functions to the abnormal levels of

those altered by disease ; and that while sometimes the one, sometimes the other course is wiser, the choice must be cautious and deliberate :

That certain definite chemical relations between the agents of the *materia medica* and the structures or functions they influence are to be established :

That all secrecy, as to the nature of remedies used, must be scrupulously avoided and discountenanced :

And that those measures other than drugs, which have proved so signally successful in certain striking cases, must be studied and developed to the highest point of usefulness.



